SOCIAL AND DIGITAL INNOVATIONS: CREATIVE INTERACTIONS RESPONDING TO THE MULTILEVEL CHALLENGES OF EMPLOYMENT

Creative interactions, responding to the multilevel challenges of employment, involve products and services sustained by technological innovations such as Big Data, Blockchain, the Internet of Things (IoT) and Artificial Intelligence (AI), accompanied by a firm commitment to Sustainable Development Goals.

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TECHNOLOGY AND THE JOB MARKET

The Fourth Industrial Revolution is defined by the adoption of cyber-physical systems that combine physical, digital, and biological elements in complex solutions. Building on the technologies spearheaded by the Third Industrial Revolution, this new process of automation is promoting the industry-wide usage of technologies such as robotics, artificial intelligence, nanotechnology, quantum computing, biotechnology, the Internet of Things, decentralised consensus, fifth-generation wireless technologies, additive manufacturing/3D printing and fully autonomous vehicles. The disruptive potential of these technologies is going to affect the job market in several ways.

The 2016 study by the World Economic Forum [1] shows that effects of several technology drivers are already felt in the workforce. Mobile Internet and cloud technology enable internet-based service models to spread rapidly and promote the delocalisation of services:

- New energy supplies and technologies are shaking up the global energy market and disrupting the traditional big players in the field.
- The sharing economy, promoted by crowdsourcing and peer-to-peer platforms, is introducing new business models that promote the casualisation of existing jobs.
- Other technology drivers are expected to have a significant impact in the short term. Advanced robotics with enhanced senses, dexterity and intelligence will start to perform service jobs that were previously considered as for humans only, such as cleaning and maintenance.
- Advanced autonomous systems could revolutionise transportation by as soon as 2020. This will result in the loss of existing positions to automation, removing the need for a significant proportion of the workforce.

But automation will not only affect more menial tasks. Recent advances in various domains of artificial intelligence such as machine learning, natural language and image processing as well as deep learning are enabling knowledge-related tasks that have long been considered as suitable only for humans to be automated.

The upcoming technological revolution will also have an impact on an increasingly mobile society, and trends that have emerged in previous years will accelerate due to the digitalisation of society [2]. Migratory flows, for economic or humanitarian reasons, generate new needs related to the integration of these groups into the social and economic network of the country of arrival. Moreover, the delocalisation of production (and its economic consequences) and the growing possibility of remote working implied by the changing labour paradigm sets some challenges:

- On the one hand, many humanitarian migrant groups are not able to be instantly integrated into the economic structure of the country of arrival.
- On the other hand, economic migrants look for motivations and opportunities, which are missed in their own countries. Low-skilled individuals who migrate in search of better economic opportunities will look for promising, emerging markets. However, with the implementation of the new technologies mentioned above, the labour market will change and this may bring critical changes for such groups.

High-skilled individuals who do not find work motivations now have increasing access to emerging labour markets and opportunities through ICTs. This may mean that countries

that fail to balance opportunities for both types of skill-sets will be hit hard due to the increasingly dynamic economic situation. Resources may be outsourced and the different worker-profiles that will be needed will be disseminated: the economies with most benefits for the individual will take advantage of this.

DIGITALISATION, WHERE SOCIAL INNOVATION MEETS GLOCAL EMPLOYMENT CHALLENGES

Digital transformation extends into, permeates and impacts every level of society and affects every sector of the economy. According to the European Commission's Digital4Development initiative, digitalisation acts as an accelerator and as an enabler of many, perhaps all of the Sustainable Development Goals (SDGs). Moreover, it is precisely where digitalisation meets social innovation and employment that it might be possible to tackle the major societal challenges of the years to come and find solutions to target several SDGs.

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Digitalisation and employment cut across different Sustainable Development Goals as transversal themes in UN's 2030 Agenda. Digital solutions together with social innovations, especially those oriented towards employment, will be able to promote job creation, regional development and competitiveness – actions against exclusion, poverty, inequality and resource scarcity.

The UN stresses that "half the world's population still lives on the equivalent of about US$2 a day" [3] and that women's participation in the labour force is still much lower than men's (not to mention that there is currently a global gender pay gap of 23 %). Therefore, Goal 8 – *Decent work and economic growth* sets specific targets related to protecting labour rights for having safe and secure work as well as objectives for ensuring equal job opportunities for different social groups. The generation of new online services contributes to job and skills creation and, from the industrial viewpoint, highlights the importance of creating more jobs in order to reduce the global unemployment rate and enhance the development of different countries and regions. In this respect, employment is also featured in *Goal 9 -Industry, Innovation and Infrastructures,* which advocates that increasing jobs has a positive impact on society, and therefore sets a target for raising the share of employment accounted for by industry.

Accordingly, a social approach to employment can be also found in *Goal 4 – Quality Education,* which sets targets for promoting equal access for women, men and young people to affordable, quality education so as to improve skills which are needed for employment, decent jobs and entrepreneurship. The same goes for *Goal 5 – Gender equality,* which sets a target for giving women equal rights to economic resources and *Goal 10 – Reduced inequalities,* which responds to the problem of income inequality between different social groups.

For its part, the European Union has been deeply concerned about managing the digital transformation of EU society and its economy in recent years [4]. Since the launch of the Digital Agenda as a pillar of the Europe 2020 Strategy significant initiatives have been set up to address the challenges of digitalisation and seize its emerging opportunities. A review of those EU actions and initiatives covering various scopes and policies (such as education, employment, economic strategy, financial framework, etc.) reveals that employment is a cross-cutting topic. The European Commission's objective is to encourage market uptake of innovative solutions and stimulate employment. As a result, it is possible to systematise connections between employment and digitalisation in the following challenges highlighted recently by the EU:

- Measuring and evaluating national and EU situations to design policies for dealing with digital and employment challenges
- Promoting national policies to tackle the challenges of digitalisation and the labour market
- Workforce adaptation to technological transformations in labour markets
- Taking advantage of digital transformation to increase economic efficiency and provide new employment
- Giving EU financial support to help attain the expected benefits from digital transformation
- Providing better public employment services to citizens through digital transformation
- Reducing the digital gap and polarisation, thus preventing some people or regions from being left behind.

> **Social innovation, in conjunction with digital solutions, can find complementarities and synergies between programmes and initiatives and between policy levels and fields leading to inclusive, sustainable nested systems.**

DIGITALISATION AND SOCIAL INNOVATION: A MULTILEVEL CONTRIBUTION TO TACKLING EMPLOYMENT CHALLENGES

Training institutions, companies, policy makers and individuals need to prepare for rapid labour market developments, with digitalisation helping to tackle challenges from the incremental to the disruptive. Therefore, with digitalisation playing a major role in the handling of multilevel challenges for adapting to rapidly changing labour markets, social innovations will find many fields and dimensions in which they can intervene.

Social innovation, in conjunction with digital solutions, can find complementarities and synergies between programmes and initiatives and between policy levels and fields leading to inclusive, sustainable nested systems [5] and the attaining of the 2030 Agenda targets. The following challenges have been identified at different intervention levels:

Systemic level

The right combination of digitalisation and social innovations could address:

Training and provision of basic and advanced digital skills depending on the needs of the target population.

The shortage of high level profiles (STEAM) and lack of engineers (especially girls and women). Human mobility and talent attraction and retention policies will play a major role.

New communication channels that could enhance women's participation in the workforce and everyday life and provide access to education, finance and social networks

National, regional and/or local levels

Identification of sectors for the future linked to specific local or regional levels to boost their competitiveness, development, inclusiveness and sustainability.

Balance of worker-profiles needed for regional/local development and competitiveness in alignment with the Smart Specialisation Strategies, the region's employment and digitalisation targets and foresight exercises for identifying future sectors and scenarios.

Managing the constant in/out-flows of low and high-skill migrants with adequate inclusion policies and social innovation initiatives to provide suitable employment paths to a digital labour force.

Institutional level

Companies and training providers must anticipate and flexibly adapt to the needs of future sectors based on foresight exercises.

E-teaching and e-learning provide for flexibility and the opportunity to access teaching material provided by leading education institutions (SDG4).

Update training programmes and contents to respond to personal career development paths and market needs.

Managing future mobile workplaces and cloud working in innovative ways to generate in-company dynamics and collaborations between individuals and experts in different fields.

Individual level

Work transitions over the course of life within the unprecedented development of new technologies and the pace of global mobility.

Agency as a more active form of engagement for all in the labour market will contribute to both human development and a stable, resilient citizenship.

Planning Life Long and broad Learning paths to equip individuals to successfully manage labour market transitions as stated in the European Pillar of Social Rights.

Identification of four different challenges at different intervention levels

CONCLUSION

In the upcoming technological revolution, digitalisation will play a paramount role affecting the labour market at multiple levels. Analysing the main needs, challenges and areas of impact can provide valuable insights into where and how to propose solutions and strategies. In alignment with the 2030 Agenda, upcoming paradigms will offer frameworks for innovative initiatives to foster inclusiveness of vulnerable groups.

The confluence of social innovation, employment and digitalisation opens up myriad opportunities, challenges and innovative responses at different levels, from the individual to the systemic, from personalised paths to global solutions, from local development policies to disruptive changes in all fields (health, finance, leisure, education, etc.).

To generate creative interactions able to respond to the multilevel challenges of employment, there is a need to initiate processes of reflection on the type of society that a given community seeks to achieve. Feedback-loops, trust building, and a deep understanding of the multilevel needs of multiple stakeholders, interests and rates will help to reach a common consensus.

The aim is to generate 'nested ecosystems' around the challenges identified in a given context with the focus on protecting the most vulnerable, as in a nest. By taking care of those that cannot survive without the help and assistance of the community, these 'nested ecosystems' can foster 'win-win' balanced interconnections and a mix of cooperation and competitiveness needed to achieve wellbeing, development, sustainability and inclusion [5].

Identification of areas of intervention in which social innovation can help to meet employment and digitalisation challenges

Examples of interchanges outlining social innovation's contribution to the main challenges of employment and digitalisation
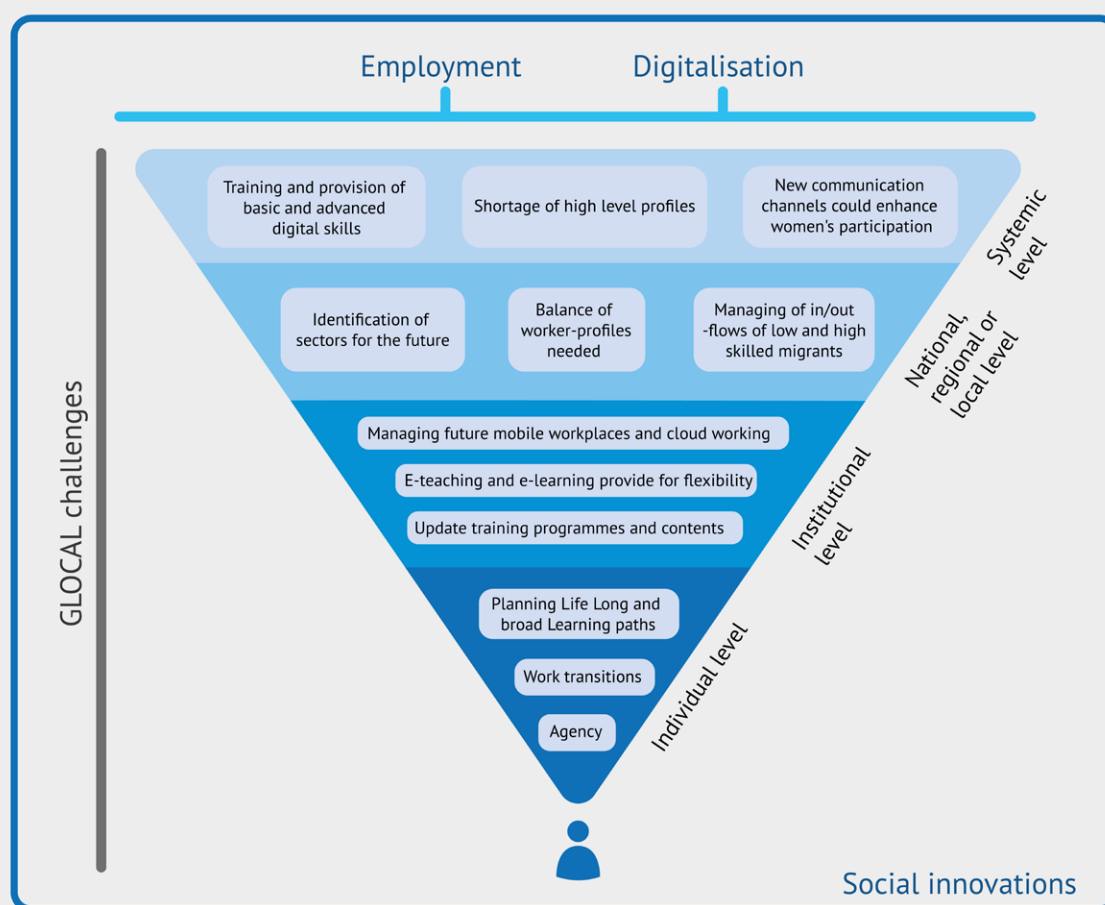
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